

On line NanoAlb - WEBINAR



One Size Does Not Fit All : Nanoparticle Application and Challenges in Oilfield Applications

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Commercial products such as the use of TiO₂ in sunscreen, which utilizes the high thermal conductivity of nanoparticles, and other properties that attribute to coatings/ films, have recently triggered a hype in the use of nanoparticle's in various industries. For example, in the biomedical/biotechnology industry, nanoparticles (NP) are used extensively as carriers or binders to cells (especially Au particles), whereas in electronics, they are applied in microchips. Accordingly, the oil and gas industry has followed suit by investigating and applying the technology actively the past decade. A large focus has involved all possible considerations involving the down-hole fluids product line of the oil and gas industry.

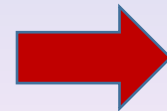
In contrast to other industries, the oil and gas industry, has been less diligent in understating the appropriate use of nanoparticles in suitable applications for their respective product lines. For instance, a lot of studies conducted have been based on 'trial and error' methodology, or have attempted to explain the functions of NP's based on theories and applications that are 'already known' to the industry, but are not particularly applicable or relevant. For example using NP's as filtration control in shale drilling. However, it is difficult to understand how filtration might occur in the absence of considerable Darcy flow in shales due to their low permeability. Regrettably, due to these inaccuracies, lack of evidence, and limited clarification of the results observed, has questioned the credibility of the benefits associated with NPs.

This 'copy-paste' mentality that the oil and gas industry relies on needs to be shed and the employment of NPs needs to be observed from a different angle. A case can be made that more attention is needed on the fundamental science in understanding the principle mechanisms governing the theories that support the benefits of nanoparticle, pertinent to the chemical physics that explains the behavior of the NPs engagements.

In order to truly discover a nano-application for NPs in drilling & completion applications, one must perform appropriate screening, compatibility, synergistic, and sensitivity testing to properly design and develop a suitable fluid, that is a wholly functioning water based nanoparticle drilling fluid (NPDF).

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